

REMARKS/ARGUMENTS

Reconsideration and allowance in view of the following remarks are respectfully requested.

The undersigned contacted Examiner Cecil for the purpose of scheduling a personal interview to discuss this case and the current Office Action. The Examiner requested that detailed arguments be submitted for his consideration, to determine whether a further interview would be warranted and fruitful. Accordingly, applicant's rebuttal to the Examiner's standing and new rejections are presented herein below. The favor of a personal interview in advance of further action, so that these rejections may be discussed further in person, is solicited.

Claims 1, 3, 10-11, 17, 19-20, 22, 29-30, and 35-38 were rejected under 35 USC 103(a) as being unpatentable over Isozumi et al. in view of Verlag '379. Applicant respectfully traverses this rejection.

At the outset, it is respectfully noted that the intent of Isozumi is to determine the size of each square opening (See Figures 4 and 5 of Isozumi) in a way that will prevent clogging from freezing, and the square opening (filter opening) is a dominant factor regulating the amount of fuel injected into the engine. Thus, it is noted that the object, configuration, and feature of Isozumi is different from that defined by applicant's independent claims.

Moreover, as the Examiner has acknowledged, Isozumi fails to disclose a tubular fluid passage that has a cross-sectional area equivalent to or smaller than a summation of cross-sectional areas of the holes at every point along the length of the filter section. The Examiner asserts that in view of Verlag (XP '379), however, it would have been obvious to modify Isozumi to meet the limitations of applicant's claims.

For the Examiner's information and reference, applicant has located a better copy of the Verlag publication (XP 000766379) than that supplied by the Examiner. This best copy available of that document is attached.

Applicant respectfully submits that the secondary reference to XP '379 does not teach or suggest the modification of Isozumi so as to meet the limitations of applicant's claims. In this regard, XP '379 teaches filter holes that have a total cross-sectional area that is considerably greater than the bore hole of the machine nozzle in order to reduce the pressure loss.

The attached clear copy of XP '379 clearly depicts the "tauchüsenkopf", which the Examiner has labeled as a dip nozzle head in the drawing incorporated in the rejection. Obviously, the machine nozzle corresponds to the "tauchüsenkopf". The literal translation of "tauchüsenkopf" is "dipping nozzle". Clearly, then, the "bore hole of the machine nozzle" intended by the XP '379 text is the bore hole of the dipping nozzle. The bore hole of the machine nozzle in XP '379 is respectfully submitted to be irrelevant to the claimed tubular fluid passage defined between the filter section and the inner surface of the housing or nozzle body. Because XP '379 does not provide a teaching relevant to the relationship between the holes in the filter and the tubular passage between the filter and the filter housing, it is clear that even if Isozumi could be combined with XP '379, the invention claimed by applicant would not be anticipated nor obvious.

In summary, because XP '379 does not provide any characterization of the location of the hole of the machine nozzle and in view of the way in which "hole" is normally understood, it is respectfully submitted the XP' 379 does not teach or suggest the relation between the tubular fluid passage and the holes of the filter section as required by applicant's claims 1 and 11, in particular.

Claims 35-38 are also submitted to be patentable over the applied art, the Examiner has not clearly shown any reason to reject those claims with respect to the

technical feature of these claims that "at a point in a flow direction downstream of the most downstream one of a plurality of holes" in the filter section, the tubular passage has a cross-sectional area which is equivalent to or smaller than a summation of the cross-sectional areas of all the holes of the filter section.

It appears in this regard that the Examiner did not carefully consider the limitations of these claims, which refer to the cross-sectional area of the tubular passage, not the cross-sectional area of "a hole" of the housing or "all portions" of the housing. Because these claims refer to the relationship or relative size of the cross-sectional area of the tubular passage downstream of the holes in the filter section (that is the passage defined around the filter structure) and not the rest of the apparatus, it is believed the Examiner's rejection of these claims was improper.

For the reasons advanced above, reconsideration and withdrawal of this rejection are requested.

Claims 1-3, 10-11, 17-22, 29-30 and 35-38 were rejected under 35 USC 103(a) as being unpatentable over JP '316 in view of GB '571. Applicant respectfully traverses this rejection.

JP '316 teaches a filter formed from porous silica that is sealed at the end. As noted by the Examiner, JP '316 does not teach the claimed relative sizing between the tubular cross-section and the total filter pore cross-section. However, in view of GB '571, the Examiner has asserted that it would have been obvious to one of ordinary skill in the art for the entire cross-section of all of the orifices of the filter section to be larger than the cross-section "of the fuel duct". Applicant respectfully but strongly disagrees.

The Examiner has quoted GB '751 as teaching that "the entire orifice cross-section of all of the orifices, which are preferably through-going in the radial direction, is larger than or equal to the cross-section of the fuel duct". It is respectfully noted

that the first paragraph of page 11 of GB '571 teaches that the "fuel duct" corresponds to the jet orifice 64 in the valve body 55. According to the specification of GB '571, page 7, lines 8-16, the valve needle 65 moves to open and close the jet orifice 64 (not labeled in the figures). Obviously, the jet orifice 64 in the valve body 55 is at the tip end of the injection valve on the lower side of Figure 5. Therefore, the "fuel duct" cannot correspond to the tubular flow passage defined by applicant's claims. Rather, it refers to the exit orifice of the valve body. No other description in GB '571 teaches or suggests the invention as presently claimed.

For all the reasons advanced above, it is clear that the teaching provided by GB '571 with respect to the entire orifice cross-section compares that orifice cross-section not to a tubular passage surrounding the orifices, but rather to the exit orifice of the valve body, similar to XP '379. It is therefore respectfully submitted that GB '571 clearly fails to teach or suggest the invention specifically defined by applicant's independent claims. Reconsideration and withdrawal of this rejection are solicited.

Claims 4-8 and 23-28 were rejected under 35 USC 103(a) as being unpatentable over either Isozumi in view of Verlag or JP '316 in view of GB '571 and further in view Neuman. Applicant respectfully traverses this rejection.

These claims are submitted to be patentable over the primary prior art combinations for the reasons advanced above. The Examiner's further reliance on Neuman does not overcome the deficiencies of the primary combinations.

It is further respectfully submitted that these claims are patentable over the applied art in their own right. In this regard, with regard to the Isozumi/Verlag combination, as noted above, Isozumi specifically teaches a mesh type filter with square filter openings. Even though Neuman teaches shaped filter openings, Neuman does not teach or suggest and the skilled artisan would not appreciate how the square filter mesh openings of Isozumi could be modified to correspond to the Neuman configurations.

More specifically, because Isozumi provides a square filter mesh for his filter and teaches in great detail the criticality of the size of the square filter mesh holes, it is respectfully submitted that it would not have been obvious to the skilled artisan to abandon Isozumi's invention and provide instead the shaped bores taught by Neuman. The Neuman shaped bores are not provided as a mesh, are not square in shape, and there is certainly no teaching in Neuman of how shaped bores could be provided in a simple mesh of the type Isozumi discloses. It is therefore respectfully submitted that the skilled artisan would not modify Isozumi taken alone or in combination with XP '379 in view of Neuman.

With regard to the Examiner's proposed modification of JP '316, it is respectfully noted that the filter of JP '316 is a filter tube formed from porous silica. Even though Neuman teaches shaped filter openings in a metal walled filter, this does not provide a teaching relevant to a filter formed from porous silica. Neuman does not teach or suggest how the pores of the JP '316 filter could be shaped and it is respectfully submitted that they cannot in fact be shaped as taught by Neuman. Because Neuman relates to an entirely different type of filter structure than the porous silica filter structure of JP '316, it is respectfully submitted that the skilled artisan would never combine the prior art in the manner the Examiner has suggested, much less produce the claimed invention from that combination.

For all the reasons advanced above, reconsideration and withdrawal of the rejection of claims 4-8 and 23-28 is requested.

Claims 2, 18, 21, 23 and 26 have been rejected under 35 USC 103(a) as being unpatentable over Isozumi in view of Verlag and further in view of Stamstad. Applicant respectfully traverses this rejection.

Stamstad discloses a filter having a hemispherically-shaped closed end defining the fluid passage. However, Stamstad fails to teach or describe the relationship between the cross-sectional area of the tubular area and the summation of the cross-

sectional area of the holes in a filter section. Therefore, Stamstad does not overcome the deficiencies of the primary combination and these claims should be allowable for the same reasons.

Claims 24-25 and 28 have been rejected under 35 USC 103(a) as being unpatentable over JP '316 in view of GB '571 and further in view of JP '209. Applicant respectfully traverses this rejection.

The Examiner has suggested that it would have been obvious to arrange the pores of JP '316 as a helical line of pores in a substantially regular interval. As noted above, JP '316 relates to a filter formed from porous silica. JP '209 does not teach or suggest how the pores of a porous silica material can be disposed in a regular helical line as in JP '209. Indeed, it is respectfully submitted that there is no basis whatsoever for modifying JP '316 in view of JP '209 and perhaps more importantly, the applied art does not teach or suggest how a porous silica filter material could be modified in the way the Examiner has proposed. It is therefore respectfully submitted that the Examiner's proposed prior art combination is improper. It is further respectfully submitted that even if the pores of the porous silica could be arranged in the manner the Examiner suggests, the resulting combination would still not teach or suggest the invention claimed because the relationship between the tubular passage and the holes of the filter, as defined in applicant's independent claims, would still not be taught or suggested for the reasons established above.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

YAMAGUCHI et al.
Appl. No. 10/622,660
October 6, 2008

Respectfully submitted,

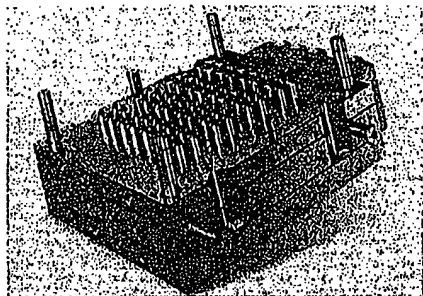
NIXON & VANDERHYE P.C.

By: 
Michelle N. Lester
Reg. No. 32,331

MNL:slj
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

Heiße Seiten für bis zu 64 Kavitäten

Komplette, einbaufertig montierte sog. heiße Seiten für Heißkanalwerkzeuge werden jetzt auch für Mehrfachwerkzeuge mit bis zu 64 Kavitäten von der Eurotool GmbH, Bensheim, angeboten. Diese umfassen außer dem Heißkanalsystem mit Angußbuchse, Verteiler und Düsen auch die Aufspannplatte sowie die Zwischenplatte, die den Heißkanalverteiler und die Düsen aufnimmt. Der Werkzeugbauer muß lediglich die anwendungsspezifische Formplatte mit



Einbaufertig montierte heiße Seite für ein Heißkanalwerkzeug mit 64 Kavitäten

den Formnestern herstellen und auf die Zwischenplatte aufsetzen.

Die Zwischenplatte kann zweiteilig ausgeführt sein, d.h. aus Platte und Stützrahmen bestehen, wobei einteilige Platten zu bevorzugen sind. Alle Massekanäle des Heißkanalverteilers sind in einen Stahlblock eingearbeitet. Im Vergleich zu Ausführungen mit mehreren Verteilerebenen besitzt das gesamte Heißkanalsystem eine wesentlich höhere Sicherheit gegen Leckagen.

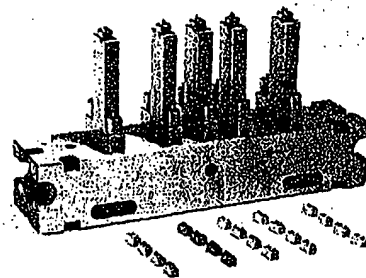
Die heißen Seiten lassen sich mit den innenbeheizten Düsen der T-Serie oder mit den außenbeheizten Düsen der CA- und CB-Serie ausstatten. Alle Fließweglängen von der Maschinendüse bis zu den Anschnitten sind gleich, so daß alle Kavitäten gleichmäßig gefüllt werden. Eine strömungsgünstige Schmelzeführung erlaubt u.a. rasche Farbwechsel. Die flexiblen Rohrheizkörper sind auf beiden Seiten des Verteilers entlang den Massebohrungen verlegt und besitzen eine gleichmäßige Leistungsabgabe. Zudem sorgen keramische Abstützelemente für geringe Wärmeverluste. Insgesamt werden eine homogene Temperaturverteilung und eine exakte Einhaltung der Solltemperatur erzielt.

(300013)

Hohe Auslastung durch Reihensysteme

Kleinste Artikel mit kleinsten Abständen im Mehrfachwerkzeug können wirtschaftlich und ohne Abfall mit Reihensystemen gefertigt werden. Diese Systeme von der Heitec GmbH, Burgwald-Bottendorf, ermöglichen Düsenabstände von nur 11 mm, so daß die Kavitätenzahl pro Form gegenüber konventionellen Systemen verdoppelt oder sogar verdreifacht werden kann.

Der Führungsring im Spitzenbereich sichert die zentrale Lage. Die Zentrierung am Düsenkopf erfolgt über Stifte zu Bohrungen, in der die Stifte gleichzeitig Druckrollen für die Abstützung aufnehmen und sichern. Neben der einfachen Montage zeichnen sich die Systeme durch eine hohe Servicefreundlichkeit aus. Der Anwender kann die



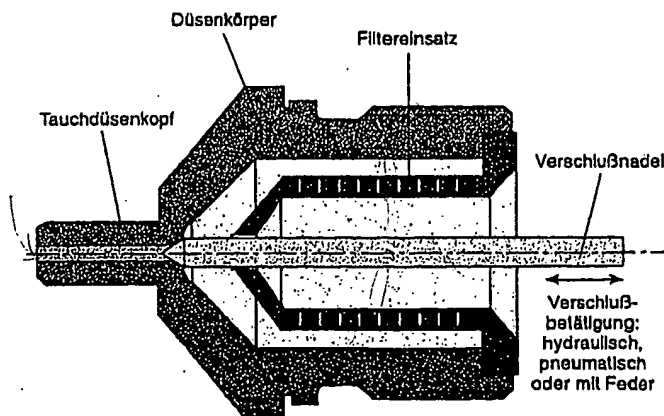
Reihenheißkanal mit fünf Düsen

standardisierte Heizung und den in der Spitze angeordneten Thermofühler selbst austauschen. Alle gängigen Standardregler sind einsetzbar. (300014)

Siebeinsatz für Verschußdüsen

Das Streben nach immer kürzeren Zykluszeiten führt zum Einsatz von Verschußdüsen, damit auch während der Maschinenbewegung die Plastifizierung erfolgen kann. Um das Verstopfen der entsprechenden Düsen durch Schmutzpartikel zu vermeiden, werden schon viele Jahre Siebeinsätze für die Maschinendüse oder den Heißkanal verwendet. Die abgebildete Siebdüse zeigt einen Siebkörper, der mit einer Nadelverschlußdüse kombiniert ist. Dieser Filtereinsatz der Rainer Huber GmbH, Malterdingen, ist insbesondere für das

Hochleistungsspritzgießen konzipiert. Eine entsprechende Anzahl von Bohrungen, deren Gesamtquerschnitt wesentlich größer als die Bohrung der Maschinendüse ist, reduziert auch bei hohen Einspritzgeschwindigkeiten den Druckverlust auf ein Minimum. Der Durchmesser der Filterbohrungen wird so gewählt, daß nur solche Schmutzpartikel durchtreten können, die den Heißkanal oder den direkten Anspritzpunkt nicht verschließen. Zur Reinigung wird der Düsenkopf mit Filtereinsatz abgeschraubt. (301011)



Diese Verschußdüse mit Schmelzefilter ist insbesondere für hohe Einspritzgeschwindigkeiten konzipiert